

**Student Learning Outcomes Assessment**  
**Department: Geosciences**

**Academic Year: 2016-2017**  
**Program: BA Geography**

Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
2016	Obj 4. Develop capacity for integration and synthesis with respect to geographical opportunities and problems.  Competencies include (a) analysis, critical thinking, problem solving; (b) teamwork and problem solving; (c) synthesis and advanced accomplishment, building on acquired geographical knowledge and skills.	Grade for culminating assignment in 2 upper-level courses:  (A) GEOG 320 Physical Geography (N=47 ) [define the boundaries of a physical region; characterize the physical geography within the defined boundaries].  (B) GEOG 415 Seminar – topic: Dendrochronology (N=7) [scientific report documenting collection and processing of tree-ring samples, data analysis, discussion/conclusion].  At least 70% will receive a grade of $\geq 70\%$ .	(A) 77% achieved $\geq 70\%$ .  (B) 100% achieved $\geq 70\%$ .	(A) <u>Senior Exit Survey</u> May 2017, question regarding preparation associated with “analytical and reasoning abilities” (N=18, all Geosciences majors combined).  (B) <u>Alumni surveys</u> (received 12/2014 to 3/2017, respondents graduated between 2003 and 2010) regarding preparation for employment with respect to “analytical and reasoning abilities” (N=25 , all Geosciences majors combined).	Mean outcomes from surveys, scored on a scale of 1 (worst) to 5 (best):  (A) 4.5  (B) 4.4
<b>Impression</b>		A number of upper-level geography courses require a culminating term project. Students have opportunities to practice analysis, critical thinking, and synthesis.		Graduating seniors and alumni appear satisfied with their analysis and synthesis skills.	
<b>Limitations</b>	GEOG 320 is a required course for all majors, and is typically taught each spring semester. Some majors may take GEOG 320 in their sophomore year, and therefore do not have extensive “acquired geographic knowledge and skills” to build upon yet.			Seniors and Alumni survey results are not distinguished by major degree, and therefore are not explicitly associated with geography graduates; nonetheless, all respondents indicated that were at least “adequately” prepared with respect to analytical and reasoning abilities.	
<b>Proposed Action Item: Assessment Tool</b>	Develop a rubric to assess the “teamwork and problem solving” competency of this objective.				
<b>Proposed Action Item: Program Content and Course Assessment Practices</b>	Develop and incorporate at least one team-based problem-solving project into a Planning course to assess for objective 4.				
<b>Action Items Implemented</b>	Non-software field-methods seminar taught Fall 2016 (topic: Dendrochronology). Trial rubric for Geographic Information Literacy developed.				
<b>Objective to be Assessed Next Year</b>	Objective 5 A liberal arts education that will make the student a better citizen. Competencies include (a) civic knowledge and engagement; (b) intercultural knowledge and competence; (c) ethical reasoning and action; (d) foundations and skills for lifelong learning.				

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Year	Objective	Direct Measure (DM)	DM Results	Indirect Measure (IM)	IM Results
Spring & Fall 2016	Obj. #6: To provide students with an understanding of current social and ethical issues related to the environment.	<p>Embedded questions on exams in required GEOS courses (*); Class exercises (*); Specific required and allied courses that revolve around the earth-human-environment nexus.</p> <p>Variety of qualitatively assessed actions, activities and strategies embedded and implemented throughout the Geology curriculum.</p> <p>Geology field camp rankings (**).</p>	<p>The total percentage of geology students successfully accomplishing measures of this objective is 91.3%. Please see summary of courses assessed at the end of this document. Courses (required or allied) such as GEOG145, GEOG245, GEOG425, GEOG545, GEOS375, GEOS430, GEOS593 (Marcellus Shale, Anthropocene) are purposefully constructed with this objective in mind.</p> <p>In several courses, students provide signatures and other indications as verification of ethical conduct on take-home exercises, writing assignments, field etiquette and group work.</p> <p>Four GEOS students attended geology summer field camp in 2016. Inquiries for student rankings were sent to each host institution, with all 4 students being ranked. Our students ranked 4<sup>th</sup> and 17<sup>th</sup> out of 23 (SUNY-Cortland), 31<sup>st</sup> out of 50 (IU-Bloomington), and 2<sup>nd</sup> out of 27 (SD SM&amp;T).</p> <p>Two field camp participants were awarded highly competitive NAGT field scholarships (2 of 18 total nationwide).</p>	<p>Student exit survey (^) and Alumni survey (^^) results and comments.</p>	<p>Student Exit and Alumni survey results (!) from spring 2014 to spring 2016 do not indicate any responses to Objective #6. No questions on either survey specifically address aspects of this objective.</p> <p>When asked which classes in the Geosciences curriculum were the most important, 25% of alumni (17 of 68) selected courses that had clear, obvious connections to geoethics and societal awareness (such as Environmental Planning, Environmental Geology, Hydrogeology, Geography of Water Resources).</p> <p>When asked which classes should be added to the curriculum, several alumni indicated courses with clear environmental themes and societal relevance (Environmental Policy, Environmental Geochemistry, among others).</p>
Impression	<p>We have clear but limited ways to measure student success with respect to an understanding of current social and ethical issues related to the environment.</p> <p>To gauge success for this objective is difficult, with <i>many</i> actions used but not measured.</p>	<p>Students show a high level of success in acquiring an understanding of current social and ethical issues related to the environment. Many GEOS students are enrolled as Geology – Environmental majors, and most GEOS students take numerous courses with an environmental focus. With that said, quantitative data acquisition is limited and incomplete. Qualitative actions to address and embed this objective are used throughout the curriculum. Development of more and better instruments to measure success quantitatively, however, are necessary.</p> <p>Student rankings at field camp indicate an acceptable level of performance, equivalent to mid to upper “B” level work (#). Two students ranked near the top of their field camps, and 2 students received prestigious NAGT field scholarships. Both are clear indicators of program quality and student performance.</p>	<p>No questions on either Student Exit or Alumni surveys specifically address aspects of this objective.</p> <p>Alumni indicate that courses addressing an understanding of current social and ethical issues related to the environment are an important component of the education of GEOS students.</p>		

Limitations	Small number of Geology faculty (4 full-time, tenured faculty, with 1 currently serving as Dept. Chair, and 1 regular part-time faculty) to cover wide breadth of societal awareness and ethics issues in the discipline.	Faculty expertise and training is only peripheral to this objective.
<b>Proposed Action Item: Assessment Tool</b>	<ol style="list-style-type: none"> <li>1. To re-evaluate GEOS course activities and embedded questions to align better and more completely with Objective #6.</li> <li>2. To continue to build and formalize assessment tools (mechanisms and rubrics) for measuring this objective.</li> <li>3. To create and embed questions pertinent to this objective into both the Student Exit and Alumni surveys.</li> </ol>	
<b>Proposed Action Item: Program Content and Course Assessment Practices</b>	<ol style="list-style-type: none"> <li>1. Develop more direct and indirect measure instruments for Objective #6 and conduct further assessment. We've struggled to arrive at meaningful measures that can be readily implemented. Yet, because of its importance and relevance as a learning objective, we continue to explore how best to assess it. Workshops that focus on teaching geoethics across the Geoscience curriculum have 1) provided us with the initial framework to integrate this objective into our curriculum and 2) given us strategies to develop the tools to assess it. More webinars, conference technical sessions and such concerning this topic are on the horizon. The Geosciences community at the (inter)national level recognizes its importance and is actively raising awareness. We will continue to learn and adopt best practices in developing our assessment of this objective.</li> <li>2. Consider developing new course offerings that focus on exploration of the earth-human-environment nexus. Possibilities include Sustainability, Earth Systems, Surface Hydrology, Geography of Energy and others.</li> </ol>	
<b>Action Items Implemented</b>	Successful instruction of two new courses (GEOS410 and GEOS430) and implementation of a new BSGS Energy Resources track; Continue to explore options for a capstone course and/or experience; Student Exit and Alumni surveys are now available electronically, with little effect however on improving low response rates. Also, electronic survey results currently do not distinguish between different majors within Geosciences.	
<b>Objective to be Assessed Next Year</b>	We will assess <i>Objective #1: to develop skills of analysis, synthesis, critical thinking and problem solving – largely via the scientific method</i> next year.	